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OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

MEMORANDUM

SUBJECT: Clarification and Guidance Regarding Cathodic Protection/Monitoring of Double-walled Steel USTs

FROM: Anna Hopkins Virbick, Director
Office of Underground Storage Tanks

TO: State UST/LUST Program Managers
Regional Program Managers

Introduction

On July 18, 1991, a technical interpretation was issued from this office (attached) to Mr. Charles Frey of the Highland Tank and Manufacturing Company regarding, in part, the issue of whether or not the federal regulations at 40 CFR Part 280 require cathodic protection (CP) monitoring of double-walled underground storage tanks (USTs), where both walls are made of steel. Since its issuance, this correspondence has generated some confusion and concern. Today's memorandum clarifies the Environmental Protection Agency's (EPA's) position on this matter and provides guidance to implementing agencies.

Discussion

A. Corrosion protection

The July 18, 1991 letter appears to have left some readers with the incorrect impression that double-walled steel tanks are not required to have corrosion protection. It is EPA's position that **all** tanks, including double-walled steel tanks, must be protected from corrosion according to the federal regulations for new tanks at § 280.20 and for existing tanks at § 280.21. This position is supported by the regulatory language at § 280.20(a) which states:

> Each tank must be properly designed and constructed, and any portion underground that routinely contains product must be protected from corrosion....

By saying "any portion underground," the regulations are referring to any portion **of the tank** that is underground. A double-walled tank has an inner and outer wall, both of which are considered part of one single tank. Therefore, any portion of the tank (meaning both the inner and outer wall in the case of a double-walled tank) that is underground and routinely contains product must be protected from corrosion. A steel inner wall is protected from corrosion by an intact outer wall, while the outer wall is protected from corrosion using one of the methods listed at § 280.20(a). This position is also supported by § 280.21 which requires all existing tanks that do not meet new tank standards or closure requirements to add corrosion protection by December 22, 1998. Corrosion protection options for existing steel tanks include internal lining, cathodic protection, and internal lining combined with cathodic protection.

B. Cathodic Protection Monitoring With Respect to Inner and Outer Tank Walls

In addition, the July 18, 1991 letter to Mr. Frey of Highland Tank discusses CP monitoring with respect to inner and outer tank walls — the outer wall is in contact with the ground while the inner wall routinely contains product. The letter states:

> In a double-walled steel tank the inner wall of the structure contains the product but it is protected from external corrosion by the outer wall. **Thus, cathodic protection monitoring of the outer wall is not required under EPA regulations**.

(emphasis added).

The second sentence of the above statement is incorrect. For a cathodically protected double-walled steel tank, the inner wall is protected from corrosion by the outer wall while the outer wall is protected from corrosion by the cathodic protection system. It is the EPA's position that both inner and outer walls are part of a single UST system. According to § 280.31(b):

> All UST systems equipped with cathodic protection systems must be inspected for proper operation by a qualified cathodic protection tester in accordance with the following requirements....

The requirements discussed following this statement in the regulations include the test conducted within six months of installation and every three years thereafter and 60 day inspections of impressed current systems. Therefore, since the outer wall of a double-walled tank with cathodic protection is part of the UST system, that cathodic protection **must** be inspected for proper operation in accordance with § 280.31.

C. Cathodically Protected Double-Walled Steel Tanks with Interstitial Monitoring

The issue that prompted Highland Tank to approach the EPA was whether the protection afforded by the triennial CP monitoring requirement at § 280.31(b) could be achieved in an alternative way for cathodically protected double-walled steel tanks. Its position was that using

interstitial monitoring for release detection on a cathodically protected double-walled tank should be accepted by EPA as a technically equivalent substitute. It pointed out that the inner wall of a protected double-walled tank is shielded from external corrosion by the protected and coated outer wall, and in the unlikely event that corrosion should breach the outer wall, it would be detected by the interstitial monitoring system before external corrosion could significantly damage the inner, primary-containment wall. Highland Tank's basic justification for this position was its belief that these tanks are more protective than cathodically protected single-walled steel tanks and that CP monitoring was unnecessary and duplicative when interstitial monitoring was used with the double-walled tank.

EPA agrees that cathodically protected double-walled steel tanks with interstitial monitoring capable of detecting a breach in both the inner and outer wall are very protective of human health and the environment. Therefore, we reviewed the language in the regulations to determine whether cathodic protection monitoring flexibility was allowed in this case. The following are our findings.

> One of the regulatory requirements for steel tanks with cathodic protection is that CP systems are operated and maintained according to § 280.31 or according to guidelines established by the implementing agency (§ 280.20(a)(2)(iv)). In addition, § 280.31(b)(1) requires all UST systems equipped with CP be tested within six months of installation and at least every three years thereafter or according to another reasonable time frame established by the implementing agency. These requirements apply to both new and existing UST systems. In addition, implementing agencies are given the flexibility to establish guidelines alternative to those specifically listed in the regulations.

Based on these findings, EPA recommends that implementing agencies use this flexibility and establish the following criteria and guideline.

> If an UST meets **all** of the following criteria:
>
> 1. Double-walled tank, both walls made of steel.
> 2. Cathodically protected.
> 3. Interstitial monitoring capable of detecting **one** of the following:
>   a) a breach in the inner and outer tank walls.
>   b) an ingress of product and water into the interstitial space.
>
> Examples of interstitial monitoring which satisfy the third criterion are a vacuum monitor, a liquid-filled interstice with level monitoring, a float sensor that reacts to both water and product, or monthly manual sticking of the interstice. An example of interstitial monitoring which does not satisfy the third criteria is a sensor capable only of detecting either product (like many vapor sensors) or water. Different sensors can be combined to meet the criterion.

Then apply the following guideline:

> Require the CP monitoring time frame to be within six months of installation of the CP system and after any activity that might affect the CP system (some examples include but are not limited to: retrofit activity, excavation close to the UST, or maintenance that might affect the rectifier).
>
> Note: This guideline applies to new tank installations and to existing tanks that meet the criteria listed above and have at least one cathodic protection monitoring event as specified at § 280.31(b). For those tanks that have never been subjected to a cathodic protection monitoring event, EPA recommends that a monitoring event be performed according to § 280.31(b) prior to applying this guideline.

If any one of the criteria are no longer met, then this recommendation no longer applies and triennial monitoring of the cathodic protection system is necessary.

The initial monitoring of the CP system ensures that the UST system is being protected from corrosion following installation while monitoring after any activity that could affect the CP system addresses any potential problems that occurred because of that activity. Implementing agencies have the flexibility to determine the specific activities that would trigger a monitoring event. In addition, the interstitial monitoring will detect a wall breach or ingress of product and water, allowing the problem to be fixed before any regulated substance can be released into the environment. EPA cannot recommend the guideline of "no monitoring" for a CP system on a double-walled steel tank because we do not believe that "no monitoring" can be considered "another reasonable time frame," which is specified at § 280.31(b)(1). Please note that the 60-day inspection requirement for impressed current CP systems is still required because it falls under a different section of the regulations (§ 280.31(c)).

EPA believes that periodic monitoring of cathodic protection systems on all steel USTs is a good tank management practice. However, we do not believe that significant additional protection to human health and the environment is gained by requiring cathodic protection monitoring every three years on tanks that meet the criteria described in this recommendation.

Summary

The following summarizes the key points in this memorandum:

1. Corrosion protection is required for all USTs.

2. The inner and outer walls of a tank are considered part of a single UST system and any cathodic protection attached to the outer wall must be inspected for proper operation according to the regulations at § 280.31.

3. For cathodically protected double-walled steel tanks that use interstitial monitoring capable of detecting a wall breach or ingress of product and water, EPA recommends that implementing agencies use the flexibility allowed in the regulations and require the CP monitoring time frame to be within six months of installation and following any activity that could affect the CP system.

The above memorandum supersedes information contained in our previous regulatory interpretation regarding CP monitoring requirements for double-walled steel tanks dated July 18, 1991. Please contact Paul Miller of my staff via E-mail at miller.paul@epa.gov or phone at (703) 603-7165 if you have further questions regarding this matter.

Attachment

cc: Wayne Geyer, STI
OUST Management Team
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